Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

STATED MEETING.—SATURDAY, NOVEMBER 29, 1862.

The VERY REV. CHARLES GRAVES, D. D., President, in the Chair.

R. R. Madden, M. D., was elected a member of the Council in the department of Polite Literature; and the Rev. J. H. Todd, D. D., was elected a member of the Council in the department of Antiquities.

J. BEETE JUKES, M. A., F. R. S., read a paper—

ON THE FLINT IMPLEMENTS FOUND IN THE GRAVEL OF ST. ACHEUL, NEAR AMIENS, AND THEIR MODE OF OCCURRENCE.

ON my return from a Continental trip in August last, I halted for a day in Amiens, in order to visit the locality where the well-known flint implements have been found in some of the deposits that are generally associated under the name of "the drift." These have been so thoroughly explored and described by Mr. Prestwich, Mr. Evans, and others, since the publication of M. Boucher de Perthes' work, that I could not hope to make any new observations; but I wished, if possible, to procure some of the implements, and also to acquire that kind of knowledge of the features of the neighbourhood and the "lie and position" of the beds, which can only be acquired by personal inspection.

In what I have to say, then, I appear rather as an expositor of Mr. Prestwich's papers, and as bearing witness to their accuracy and fidelity to nature, than as an original investigator. The "drift" of the north-west of France is very different from the great northern drift of our islands, which consists of materials derived from great distances, mingled in confusion with those of the neighbourhood, and all driven pell-mell over the country. In France, as was long ago shown by D'Arhtriac, the gravels and sands of each river basin contain only those materials that can be found *in situ* in the upper part of the basin itself; and even where two adjacent basins, like those of the Seine and the Somme, are separated by a water-shed that is often very low and inconspicuous, there is still no mingling of the "drift" of the two basins. This fact, together with the additional one that the fossils found in these "drifts" are all fresh water, or terrestrial forms, prove that this "drift" is the result of the river action, even where the deposits are far above the present bed of the river.* The fact that these rivers have excavated an additional hollow in their valleys, 100 or 150 feet deep, and often one or two miles in width, since the deposition of the gravels, seems to me perfectly natural, since I have arrived at the conclusion that a far greater atmospheric erosion has operated in the river valleys and over the whole surface of Ireland (see a paper "On the River Valleys of the South of Ireland" in the "Q. J. Geol. Soc.," vol. xviii., 1862). Among the fossils found in these fresh-water gravels there are many land and fresh-water shells, all of existing species, and nearly all still living in France, some ranging as far south as the south of France; but others, and those the majority, spreading more to the north, and as far north as Finland. There are also found fragments of the woolly elephant, or mammoth (*Elephas primigenius*), the woolly rhinoceros (*Rhin. tichorhinus*), the ancient ox (*Bos priscus*), the reindeer, an extinct species of hippopotamus, and others.*

---

* Marine fossils occurring occasionally in the "drift" of the lower part of the river basin merely show that the land stood at one time at a lower level, and that the sea accordingly flowed farther up the valley than it does now.

There are also in certain spots numerous flint implements and weapons to be found, evidently fashioned by the hands of an early race of men, who were contemporaneous with these animals. Those now on the table, which I was lucky enough to secure by purchase from the workmen and their children, must not be taken as examples of the best specimens that have been got, except one, which is of a different form to any that I have seen elsewhere. This is like an adze, and very similar to those implements used by the Polynesians at the present day, which can be made to act the part either of a hatchet or an adze, according as they are fastened vertically or horizontally in the handle.† A part of the original surface of the flint, which formed an indentation, has obviously been taken advantage of in this specimen, to make the grasp of the hand or the fitting of the handle more secure. A similar adaptation of part of the original surface of concretion in the flint, that which it had when it lay in the chalk, can be seen in others of the specimens, which seem to have been used as either knives, daggers, or chisels, the rest of the flint having been chipped to a point for the purpose.

I have placed alongside of these flint implements a spear-head made of quartz-rock, which I brought many years ago from Port Essington, in North Australia, where flat splinters of quartz-rock are greatly used for this purpose by the natives. This, which at first sight has a more artificial appearance than the flint implements, is in reality much less artificially formed. The original form of all chalk flints is that of a rounded lump, however irregular and sometimes grotesque may be the shape of that lump. If broken accidentally, the fracture is like that which a lump of glass would have—generally very uneven and irregular, with sharp, projecting corners. The quartz-rock, however, has evidently been naturally split, either by cleavage or jointing, into long, regular flakes, with smooth, even surfaces, only requiring a little chipping so as to produce a point to be fit for use as spear-heads. The Australians will transfix a man or an animal at a distance of thirty or forty yards with one of these stone-headed spears when launched from a *wamera*, or throwing-stick.

---

* I am not aware that any specimens of the cave bear, or the cave hyæna, or of the Irish elk (*Megaceros Hibernicus*), have yet been found in the gravels of the Somme valley, though they have been found elsewhere associated with the remains of the animals above mentioned.

† The Polynesians cut and fashioned large and magnificent canoes with these stone implements, and the Papuans of New Guinea not only make canoes, able to carry thirty or forty men, but build immense wooden houses, raised on large platforms of trees, all cut down to one level, without the aid of any metal implement.

Some of the small, flat, oval, flint implements from St. Acheul seem to me well adapted for fitting on to long sticks, so as to be used as spears, not to be thrown perhaps, but to be thrust, either into animals or enemies.

The other larger implements with a squarish form at one end, and chipped to a sharp point at the other, were evidently digging instruments, used either for grubbing up roots, or for making holes in ice, or other similar purposes. Some that I have seen in Sir C. Lyell's collection had convenient parts of the original surface of the flint left about the broad end, in order to afford a better grasp for the hand.

The first thing that occurred to me after examining the gravel pits was to find some means of determining between the true flint implements, which were originally buried in the gravel, and any spurious ones manufactured by the workmen. As it happened to be a Sunday afternoon, the men were not at work, and I had therefore an opportunity of quietly examining the undisturbed gravel in the vertical faces of the gravel pits before I went into the cottages to make purchases.

The gravel consists chiefly of flints, some whole and some broken; and on examining the broken surfaces of large undisturbed flints, I perceived that, in addition to the stains and discolourations which some of them showed, they all, even the blackest, had a peculiar "sheen" or polish, not unlike the glaze on a piece of porcelain. On breaking a few of these flints, I found that even the smoothest of the new surfaces of fracture had a very different lustre from that of the old fractured surfaces which had been formed before the flints were deposited in the gravel.

I put into my pocket, accordingly, one of these lumps of flint as a test instrument. This shows in some parts the original surface of concretion which the flint had when it lay in the chalk, as may be known by the thin white coating surrounding the dark flint, the surface of which coat is, in the gravel, often stained brown or yellow by ferruginous colouring matter. In other places this piece of flint shows some old, irregular surfaces of fracture, exhibiting the porcelain-like lustre side by side with a new fracture made by my own hammer. The latter surface has an obviously inferior kind of lustre to that on the former, being just like the surface of an ordinary gun-flint. This lump of flint is among those on the table, and a little comparison of its surfaces will enable any one, as it enabled me, to recognise the genuine flints fashioned by the old Pleistocene men, and buried in the gravel at the time of its deposition, and distinguish them from any newly fashioned imitation of them. There is a spurious example among those on the table, which one of the young boys from whom I bought them palmed off on me as a genuine one, but which differs from the genuine ones in its form as much as in the lustre of its surface. A little bit of an old fracture of surface remaining on this spurious example makes the contrast between the old and the recent surfaces more marked. The polish is apparently one that is only to be acquired by long weathering, possibly by the slow percolation of water or other similar action; and though it might no doubt be artificially imitated, yet it could hardly be done except by labour and expense which would raise the cost much beyond the few *sous* which the children ask for the most common kind of worked flints.

I only gave two francs even for the peculiar adze-like flint. One of the workmen produced this for me from a shelf in his cabin, and he would doubtless have taken less had I chosen to beat him down. This possesses the peculiar sheen or polish which attests it genuineness.

I have deposited this collection of flint implements in the Palæontological Gallery of the Museum of Irish Industry, among the fossils collected by the officers of the Geological Survey of the United Kingdom, near the skeleton of the Irish Big Horn (commonly called the Irish Elk), and some other bones of that animal, presented to us by Lady Elizabeth Butler, and also near the few specimens of bones and teeth of the mammoth and other Pleistocene animals which we possess.

I would beg leave to take this opportunity of indorsing Mr. Prestwich's explanation of the mode of occurrence of these fluiviatile deposits. He concludes that they were formed by the currents and floods of the rivers when they ran at different levels during the latter part of the process of the excavation of the valleys. The land, he says, may have stood at a lower level at one time, and he gives some independent evidence for that, and the rivers may accordingly have had different rates of velocity during its elevation. All this must have required a great length of time, during part of which geologists know, from other evidence, that the climate of France and England was more like that of North Siberia and North Labrador than it is now; and there was also perhaps a greater fall of rain and snow, and, consequently, greater occasional floods than at present.

The old savage tribes of men at this period probably lived very much as do the people of the countries alluded to above at the present day, and during the winter they would in like manner make holes in the ice of the river, and watch them, in order to spear the fish and other aquatic animals that would come to them. This would account for the number of implements found at particular spots, near the village of a tribe perhaps, or where the aquatic animals were most abundant; while the men being fewer, and more wary than the herds of land animals (mammoths and others) which they pursued, would be a sufficient reason why the bone or tooth of a man should be of even still rarer occurrence than the bones of the other animals.

W. H. Hardinge, Esq., concluded the reading of his paper on the Mapped Townland Surveys of Ireland.